

Surgery in Costa Rica

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This article describes how surgery developed in Costa Rica and how it was nurtured to its present status. The practice of surgery in Costa Rica developed slowly as a charitable service. In the past 3 decades, it became accessible to 87.6% of the population through the creation of a national health service system. Our objective herein is to give the reader an understanding of how surgical practice originated and matured in Costa Rica, viewed in the broader context of medical practice in a fledgling and poor New World colony. Also discussed are social and political sentiments in the country that are thought to have helped evolve the present surgical standard.

2001 DESCRIPTIVE DATA OF COSTA RICA

Costa Rica is a democratic republic, with its capital in San José. It has a literacy rate of 94.8%, an infant mortality of 11.2% per 1000 live births, and a birth rate of 20.3% per 1000 population (available at: <http://www.cia.gov/publications/factbook/geos/cs.html>). The republic is ranked 41st in the Human Development Index of the United Nations. It has an ethnic composition of 94% white (including mestizo), 3% black, 1% American Indian, 1% Chinese, and 1% other. In 2001, the population was almost 4 million. Age demographics included: 0 to 14 years, 31.4% (605 728 male and 578 128 female); 15 to 64 years, 63.4% (1 209 084 male and 1 181 754 female); and 65 years and older, 5.3% (92 314 male and 106 049 female). The life expectancy is 77.5 years. The climate is tropical and subtropical, with a dry season (December to April) and a rainy season (May to November), and is cooler in the highlands. The per capita income is \$3124, and electricity production is 5.3 billion kW per hour annually.

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HISTORICAL OVERVIEW

During the first 3 centuries of colonization, after Christopher Columbus arrived at Costa Rica during his fourth voyage in 1502, the country was considered a laggard with respect to the other provinces in the realm of Guatemala.^{1,2} Because little gold was found in Costa Rica (despite its suggestive name) and no mines were available for exploitation, little attention was paid to this region. An economy of survival prevailed, based on small clusters of self-sufficient working families.²⁻⁴ With the help of the scarce native population still remaining in the 17th and 18th centuries, the agriculture-based economy grew around these families of settlers. Costa Rica matured into a more homogeneous and equitable society compared with the neighboring provinces. This affected how medical practice was established in Costa Rica.^{2,4,5}

Despite the fact that a physician, Maestro Bernal, landed on Costa Rican soil with surgeon Juan Camacho in 1502 with Columbus, only 348 physicians would sojourn in the province during the next 398 years. One hundred fifty came from Europe, and most of the others came from the United States. Twenty-five came from Guatemala and 20 from Nicaragua, demonstrating the modest contributions of the region itself.^{2,4}

The first Costa Rican physician was Pablo Alvarado Bonilla, who graduated in

1823 from the University of San Carlos, Guatemala City, Guatemala. The first Costa Rican to train in Europe was José María Montealegre, who studied in England, started practice in 1840, and eventually became president of Costa Rica between 1859 and 1863.^{1,2}

Well after its independence from Spain in 1821 and because of a lack of local medical legislation, all public health undertakings were dependent on Guatemala and the *Real Protomedicato*, which were in turn dependent on the Spanish empire and the *Real Protomedicato* in Madrid. The *Protomedicatos* had their origin in a body of legislation concerning medical practice during the Roman empire. They can be considered predecessors of the modern medical colleges or associations and the groups of laws that regulate them.⁶ The first *Protomedicatos* enjoyed the professional autonomy that has characterized these groups, duly conferred by the senate or the Roman emperor himself. Under the guidance of the *Protomedicato* of Guatemala, smallpox vaccination in the Americas, begun by the king of Spain in 1802, continued in Costa Rica between 1825 and 1852. Five years later, the *Protomedicato* of Costa Rica was founded on October 19, 1857. Because of earlier models in Mexico, Peru, and other countries, the *Protomedicato* was born reasonably mature; nevertheless, the Costa Rican executive power named all its directors. It oversaw the quality of medical practice in the country and evaluated new candidates and their fitness for the profession. This body became the Faculty of Medicine of Surgery and Pharmacy in 1895, combining regulatory and academic functions. In 1940, when the University of Costa Rica, San José, was founded, it was named Colegio de Médicos and attained full autonomy and self-government, and it is now the regulatory body of the medical profession in Costa Rica.^{2,4,5,7}

Because its *Protomedicato* was born late, Costa Rica was spared much of the strife that kept physicians and surgeons apart in the Americas. In 1608, surgeon Manuel Farfan arrived in Costa Rica. However, it is likely that he did not possess any formal training or licensing. In the early 17th century, medical licensing in the Americas operated by extension of a 1593 Spanish sanction by Felipe II, similarly applied to the colonies, which mandated that surgeons be certified for surgical practice in Spain. The ordinance specified certain venues for surgical examinations and alluded to "Latin surgeons" (referring to an academic education in Latin). "Romancist surgeons," not having received formal training in Latin, could be licensed for 4 years by a "*Protomedicato*," despite not having completed all the prerequisites for Latin surgeons, provided that the location seeking the licensee had a demonstrated need of surgeons. Stories in Havana, Cuba (1602), and Buenos Aires, Argentina (as late as 1779), disclose how difficult it was to pass the examinations and obtain a surgical license. Stipulations were enforced in Mexico and in Lima, Peru, under the direction of the conquistadores. Records indicate that surgeons had been appointed there since 1610. Nonetheless, the first application registered in Mexico for a Latin surgeon to be examined by the *Protomedicato* was around 1695. Therefore, it can be presumed that before this date most surgeons were Romancist surgeons.⁶ Farfan lived in the area of Puntarenas and Guanacaste, in the western coast of the country, isolated from San José at that time, and un-

questionably was without a local surgeon or a *Protomedicato* to certify him.

However, warfare and the opening of new territories created a high demand for surgeons, leading to the foundation of surgical colleges in Cadiz (1749) and Barcelona (1764), in Spain, and the Surgical College of Mexico, Mexico City, in 1770. The main objective of the colleges was to teach anatomy and dissection and to pursue excellence in surgical operating techniques. To be accepted to these colleges, students were not required to have academic degrees. They received a combination of apprenticeship and formal education and had to pass a final examination at the end of their training. After graduation from surgical college, they would no longer be considered Romancist surgeons, but neither would they have earned an academic degree. With time, these surgical graduates were considered well trained and gradually became scornful toward simple Romancist surgeons and eventually toward physicians graduating from the best medical schools in New Spain. Between 1770 and 1813, the Surgical College of Mexico graduated 201 surgeons. The dark days of midwifery, tooth extractions, bone setting, embalming, phlebotomy, and barber sweat were left behind. Eventually, surgeons would try to oppose the physicians and gain independence from the *Protomedicatos*. However, after 2 legislative bills by the king of Spain in 1801 and 1804 separating the entities, a confusing period followed of claims and counterclaims between surgeons and physicians, involving the Council for the Indies. Overburdened with other issues, the crown finally settled the matter and reconfirmed the *Protomedicatos* to oversee surgical training in the Americas and control the licensing for surgical practice. During the rest of the 19th century, universities gradually assumed teaching of both branches of medicine, and surgical colleges disappeared.⁶

As meaningful as these events might appear toward the ordainment of surgical practice in the New World, in essence it meant a relapse to the early experiences of the colony. The Spaniards encountered a surprisingly advanced knowledge of the Aztecs in surgical treatment of battle wounds, advanced treatment of fractures, and an extensive herbal pharmacopoeia to maintain asepsis of wounds and induce anesthesia during surgical procedures. Initially, Hernando Cortés wrote to Carlos V that they needed few physicians and surgeons because medicine was so advanced in the New World, and similarly Carlos V encouraged Spaniards to attain knowledge in native medicine. Despite establishment by Cortés of a hospital as early as 1521, it became preferable in some instances to have battle wounds of Spanish soldiers treated by native healers.⁸ A Jesuit, Alonso López de Inojosis, wrote (among other medical treatises) a book about native surgery during the first half of the 16th century and described 50 herbs that were used in surgical treatments.⁹ Other New World texts on anatomy and medicine were written in an attempt to understand the medical concepts that the Spaniards confronted. However, the long arm of Spanish orthodoxy gradually reached across the Atlantic, and by the time Europeans landed in New England, Mexico was back to bloodletting and purging.⁶

Nothing more is heard about surgeons in Costa Rica until 1874. Similarly, there are references to only 3 sur-

geons in 1766 working in the realm of Guatemala, 2 of them of advanced age. This paucity of surgeons characterized territories removed from Mexico and Lima for centuries. However, late in 1874, Costa Rican surgeon Carlos Duran Cartin returned to the country as a graduate of the Royal College of Surgeons in England. With his modern training, he established the first operating room in the country, at the Hospital San Juan de Dios in San José. This hospital, inspired by the Order of Hospitaliers of St John and founded in 1852, did not become truly functional until many of its departments were defined or reorganized by Cartin.^{1,2,4,5,7} He initiated a surgical department and introduced modern anesthesia and measures to maintain asepsis and antisepsis in surgical procedures. He performed the first eye operations, created a sanatorium for 100 patients to fight tuberculosis, and advanced the cause of the creation of the Ministry of Health.

Late in the 19th century, Costa Rica entered the era of modern surgery, although the population would have to wait for almost another century until benefits would be accessible to them at large. Services at Hospital San Juan de Dios were funded by charity and would so continue for decades. The Sisters of Charity of Guatemala were brought in by the Fraternity of Charity to run the hospital.^{1,2} This association was conceived in 1845. Subsequently, it became the Junta of Public Charity, and, by the initiative of Duran in 1885, a public lottery was established by the government to fund the hospital. There were sufficient funds to run the hospital but not to pay the physicians. Eminent surgeons for decades worked part-time for free.

In 1942, the bill of the Caja Costarricense de Seguro Social (CCSS) was passed by President Rafael Angel Calderón Guardia, a physician with strong social convictions. This law laid the foundations of a national health system in Costa Rica. It mandated financing of the system by workers' pay, employers, and the state, so that coverage would be only for working persons and their families. In 1961, a new law made the health coverage universal.^{3-5,7}

Charity hospitals would continue to be financed by the lottery for some time. In 1964, Children's Hospital, San José, was created, with full surgical facilities. The CCSS then established Hospital Mexico, also in San José, where specialized medical and surgical services became widely available to the population in late 1969. Finally, in 1973, management of all hospitals was transferred to the CCSS, and the charity organization, now called Junta of Social Protection, would redirect its resources to specific sociomedical projects.

SURGICAL FACILITIES

A 2000 report indicates that the facilities of the CCSS comprised 23 hospitals with 5861 beds, or 1.5 beds for each 1000 inhabitants of Costa Rica (CCSS, written communication). In addition, the system had 97 outpatient clinics and 787 centers for integral or primary care providing curative and preventive care. For every 100 individuals in the population, 8.6 were discharged from hospitals per year. Individuals consulted the outpatient de-

Number of Surgeons per Specialty

Cardiovascular	12
Vascular	27
General	154
Orthopedic	85
Neurosurgical	28
Plastic and reconstructive	34
Urologic	42
Ear, nose, and throat	65
Ophthalmologic	97
Oncologic	20
Gynecologic and obstetric	260
Total	824

partments 2.0 times per year, and 0.4 person per year consulted a private physician. For every 10 individuals, 8.7 annually visited an emergency department.

In the hospitals where surgery was performed, there were 327 675 discharges per year, with a mean length of hospital stay of 5.5 days and an occupancy rate of 81.7%. The mortality among discharged patients was 1.9%, and the surgical procedures performed corresponded to 48.5% of all discharges. The 2000 report cites an annual 158 890 operations performed, or 4.2 operations per 100 individuals (CCSS, written communication).

COST OF SURGICAL SERVICES

Costa Rica spends 8.6% of its gross national product annually on health services. According to data in the 2000 report, this expenditure totaled \$786 million for services of the CCSS, not including preventive services of the Ministry of Health (CCSS, written communication). Of this, 50.8% annually was spent on hospitalization and 28.5% on outpatient services. The cost per operation was \$1901, with a cost per capita of \$79 for surgical services. Services rendered by the CCSS extend to 87.6% of the population (CCSS, written communication).

CAPACITY

In Costa Rica, 5273 physicians are registered, and 4200 of them are employed by the CCSS, 824 of whom are involved in surgical practice (data from Data Management Department, furnished by Colegio de Médicos y Cirujanos, written communication, June 2002). These are delineated in the **Table**.

SURGICAL SPECIALTIES

In its evolution in Costa Rica, cardiovascular surgery has seen a shift from the classic repair of calcified valvular defects as sequelae of rheumatic fever in younger individuals, to the repair of ischemic coronary vessels in older individuals. The primary cause of death at the end of the 20th century in Costa Rica has been ischemic coronary disease. The country has the capacity to train 3 residents in the specialty per year.

Peripheral vascular surgery was initiated 30 years ago by general surgeons trained in the specialty and by thoracic surgeons. Shortly afterward, the first fully trained

vascular surgeons arrived from abroad. Subsequently, rudimentary aortic synthetic prostheses were implanted, aortoiliac and carotid endarterectomies performed, and lower leg venous bypasses have become commonplace. Presently, shared stents are used for treatment of coronary and carotid obstruction, aided by cardiologists and hemodynamic laboratory data. The specialty relies on the Centro de Desarrollo Estratégico e Información en Salud y Seguridad Social (CENDEISS) to furnish future surgeons for the specialty (see "Medical Schools and Graduate Training" section).

General surgeons constituted the backbone of surgical practice until the 1970s. Many specialties initiated from the forays of these surgeons into more specialized fields and from younger surgeons tutored in the specialties. General surgery in Costa Rica has followed the world trend toward endoscopic surgery, principally performed on the biliary tract. The first laparoscopic cholecystectomy was performed in mid 1992. Many general surgeons now perform gastrointestinal endoscopies.

Orthopedics in Costa Rica underwent an early demarcation of practice venue, based on whether the surgeons were trained in Europe (France and Italy) or the United States. Limitations of the public health care system through the years had blunted expansion of the practice countrywide. The specialty in Costa Rica now comprises general orthopedic physicians managing trauma (the fourth leading cause of death in the country) at the regional hospitals, with more specialized surgeons providing advanced care at the central hospitals. Better equipment at these centers allows performance of joint replacements and specialized tumoral procedures. The specialty is investigating the introduction of minimally invasive procedures and recruitment of specialized surgeons to expand spinal surgery, which presently is performed to a small degree. Also, a bone bank is planned with the assistance of the bone bank at the Pontificia Universidad Javeriana in Bogotá, Colombia. Rehabilitative surgery is practiced at a specialty hospital, Centro Nacional de Rehabilitación in San José, providing integral care of disabled persons.

Since its inception in 1963, neurosurgery has expanded to most of the health system. The most challenging surgery is practiced in the central hospitals, where procedures involve trauma of the central nervous system and treatment of epilepsy, malformations, and vascular and tumoral abnormalities. Neurosurgeons have access to positron emission tomography, computed axial tomography, magnetic resonance imaging, and subtraction digital angiography for establishing diagnoses.

Plastic and reconstructive surgery has developed since the early 1960s and is now common practice. Specialists trained in Latin America, the United States, and Europe provide this surgery, including microvascular techniques, through the CCSS at the central hospitals. It is also prevalent as a private practice, with several internationally recognized specialists offering services to foreign individuals looking for quality surgery at a reasonable price. This international activity is monitored closely by the Colegio de Médicos y Cirujanos.

After three quarters of a century during which only a few urologists in Costa Rica diagnosed and treated the sim-

plest urologic abnormalities, these specialists now have access to modern x-ray, ultrasound, radioactive isotopes, and magnetic resonance imaging for diagnosing urologic conditions. Early-stage tumors can now be detected. Use of laparoscopic and percutaneous techniques has lagged. However, lithotripsy and pediatric urologic services are well developed. Urologists at Hospital Mexico, and to some extent at other central hospitals, have led the kidney transplantation program in Costa Rica and now perform the largest number of these transplantations in Latin America per specific population served by the surgical facility. Professionals come to Costa Rica from other countries to be trained in kidney transplantation.

Ear, nose, and throat specialty services are offered in the outpatient departments of the central hospitals. Flexible endoscopies of the pharynx and larynx and functional endoscopies of nasal and paranasal cavities are performed for diagnosis or as minor procedures. Complete audiological examinations can also be performed. When pathologic conditions are detected, otoneurological techniques and surgical procedures of the ear, base of the skull, nose and annex cavities, pharynx, and neck are available. Oncologic surgery of the head and neck is performed by these specialists in some hospitals. Some are maxillofacial surgery specialists, and others are plastic and buccodentomaxillary surgeons.

Ophthalmologic surgery has seen much progress since the 1970s, when only rudimentary procedures using rigid devices were performed on cataracts. Today, extracapsular technique requiring incisions of 6.0 mm has been replaced with techniques using incisions of only 2.5 mm, some of which do not need to be sutured. Phacoemulsification is now commonplace, and fragments of cataracts can be extracted without damage to neighboring structures. Argon laser surgery is available for patients with diabetic retinopathy. Vitrectors are used to treat detachments and hemovitreous and macular holes. Corneal transplantation is available from a corneal bank of the CCSS. Finally, CCSS is opening a new eye clinic at Hospital Mexico, funded by revenue from a public lottery. This clinic has been completed and is about to start operation. It will provide surgical services comparable to those of more developed countries.

A national cancer institute (Instituto Costarricense Contra el Cancer at La Uruca, province of San José) has been recently created. Plans are to build an oncologic hospital for comprehensive treatment of neoplastic diseases, including diagnostic, radiotherapeutic, and pharmacological services, and training and research. The surgical aspect of the discipline was originally founded and funded by Cancer Care International of Toronto, Ontario and was the most developed practice found in the country. Patients will continue to be treated surgically at the central hospitals, followed by state-of-the-art care at the oncologic hospital. In a fourth phase, the new hospital will provide most of the cancer surgery. Cancer is the second leading cause of death in Costa Rica, and 10 000 new cases are expected by 2010. There are presently 20 oncologic surgeons in Costa Rica.

Gynecologic surgery flourished in the closing decades of the 20th century, when it was practiced by general surgeons. At the end of 1950, a maternity hospital was

created that housed the first gynecologic service. Gradually, gynecologic services began to function in CCSS hospital centers. Not until 1974, when the CENDEISS was founded, did sufficient specialists become available so that the needs of the population could be thoroughly met. Since then, fully developed services have been established in all central hospitals, and the specialty is widely available, including oncologic surgery provided by gynecologists. Around 1970, diagnostic and operative culdoscopy was initiated, and laparoscopy soon followed. In the mid 1970s, a group of gynecologists from the staff of Hospital Mexico who were receiving training in laparoscopy at The Johns Hopkins School of Medicine, Baltimore, Md, established programs in Latin America, Caribbean countries, Spain, and Portugal. Laparoscopy is now taught by surgeons locally trained in Costa Rica or by Costa Ricans trained abroad. At present, laparoscopic gynecologic procedures are common in the country. A cervical cancer detection program covers more than 90% of women, with emphasis on age and risk groups. In 2000, 379 635 cytologic examinations were performed.

Obstetrics has reported an increase in the number of cesarean sections performed, because of the improved safety of the procedure and the potential of delivering more viable newborns in high-risk mothers. The incidence has increased from 5% to 25% during the last 12 years. Limited intrauterine perinatal procedures are performed to correct defects detected early during pregnancy. In vitro fertilization has been banned by the Costa Rican Constitutional Court, but the subject is being discussed at the International Court of Human Rights.

Pediatric surgery has progressed since 1964, when Children's Hospital in San José was founded. At this hospital, most specialty surgeries are provided, with multidisciplinary attention. This has enabled a diffuse practice of heart surgery and kidney transplantation. Programs for liver and thoracic organs are also being introduced. Surgical treatment for epilepsy and monitoring of this condition are available, as well as treatment of bone malignancies. The specialty is equipped to handle major pediatric trauma in a multidisciplinary fashion led by surgeon Marco Vargas, specially trained for the task, and to treat newborns with antenatally detected defects. The specialists also will treat congenital lesions, trauma, and burns. The surgical department at Children's Hospital performs 14 500 operations annually.

SURGICAL COMPLICATIONS

The issue of surgical complications is difficult to analyze because statistics about this escalating problem are underreported. During the first quarter of 2002, most surgical services reported 1 or 2 events at most. However, statistics from the infectious disease service at Hospital Mexico indicate that nosocomial infections on surgical wards averaged 12.7% for the same quarter. A retrospective study analyzing presumably clean hip fracture surgery wounds in 341 cases shows that the prevalence of deep infections in these patients reached 4.2%. Therefore, it can be conjectured that surgical site infections may occur in 10% of all types of surgery.

MEDICAL SCHOOLS AND GRADUATE TRAINING

There are 9 medical schools in Costa Rica, 1 public and the rest private. Except for the public school created in the 1960s, most schools have been established in the past 20 years.

As the predominant medical employer in the country, the CCSS foresaw the necessity of overseeing graduate training to guarantee a supply of trained professionals in accord with medical specialization trends. Therefore, in 1972, its board of directors created the CENDEISS.

Although the CENDEISS spends only 0.9% of its budget on training professionals, it has accomplished several landmark achievements in graduate training at social security institutions. The CENDEISS controls the number of residents in the institutions, therefore also controlling the evolution of specialties. Fifty-two percent of CENDEISS' budget is allocated to resident training and 11% to internships. Periodic strategic studies in collaboration with the University of Costa Rica Medical School (San Pedro de Montes de Oca, San José) assess the allotment of resources for graduate teaching. Since 1995, 1 288 specialists have graduated from the CENDEISS. Candidates are selected for admission based on general medical science and specialty written and oral examinations and an interview. They are certified by the University of Costa Rica Medical School and licensed ultimately by the Colegio de Médicos y Cirujanos. Distribution of university internships is determined by a commission representing the Academia Nacional de Medicina, Colegio de Médicos y Cirujanos, Medical Manager of the CCSS, Union Médica Nacional, and officials of the CENDEISS. Training opportunities are sought with international experts and health institutions willing to participate in mutual cooperation for improving the quality of life worldwide.¹⁰

Despite the efforts made by the CCSS to provide its own specialists, it is widely regarded by peers that further brief training abroad should be pursued to elevate graduates to the standards of international excellence.

RESEARCH FACILITIES

Although 2 hospitals have facilities in which to conduct research in animals, and some surgical research was conducted in the 1970s and 1980s, this was terminated a decade ago. The reasons are complex and beyond the scope of this article. Clinical research has virtually ceased in the country, denounced by some legislators who claim that Costa Ricans were being used as servile subjects to serve international interests in medical research. Costa Rica was considered a country in which clinical research could be facilitated. Subsequently, the Ministry of Health unauthorized most institutional review boards functioning in Costa Rican hospitals. Since the denouncement, no new ethical committees were accredited during the past year and a half, but, recently, 5 new committees have been approved.

INTERNET ACCESS

Only 5% of physicians have access to e-mail or the Internet. At 3 leading hospitals in San José, telemedical cen-

ters with audio and video facilities provide consultations via satellite, providing links to rural areas for discussion of difficult cases and hosting training teleconferences with experts. The telemedical facilities do not provide remote instruction in surgical procedures.

PRIVATE SURGICAL FACILITIES

Some 10000 other operations are performed annually in several private facilities comprising no more than 200 beds.

ANESTHESIA AND INTENSIVE CARE

Anesthesiologists provide adequate services for surgery in the country. Two hospitals have cardiac surgery services that require complex anesthetic management. A third hospital has installed the equipment and is concluding training of assigned personnel to begin this level of surgery early in 2003. Intensive care units are also available for critically ill patients for anesthesia recovery and care of postoperative conditions.

SURGICAL SOCIETY

The Asociación Costarricense de Cirugía has existed since 1953 and has close links with the Federación de Cirugía de Centroamérica y Panamá and the Federación Latinoamericana de Cirugía. It organizes a yearly national and other regional surgical congresses. In association with the Oregon Health Sciences University, Portland, the Asociación Costarricense de Cirugía has developed a training program for surgeons in trauma management. Occasionally, the Asociación sponsors young surgeons' attendance at the annual Clinical Congress of the American College of Surgeons. Through the Federación Latinoamericana de Cirugía, residents may rotate in different training programs in diverse Latin American countries. The Central American Surgical Congress is held every 2 years. The last regional congress held in Costa Rica was in 1995. The society has 150 active members.

CONCLUSIONS

In 3 decades, Costa Rica has increased its number of physicians 10-fold and now adequately provides specialists to meet the surgical needs of the country. The present capacity is a mean of 192 procedures annually per surgeon. However, as in some European health systems, waiting lists for surgical procedures are typical in Costa Rica. These delays characterize the past 10 years, despite ambulatory programs and quality control efforts introduced by the CCSS. These delays have been broadcast by the media, although recent reductions in waiting time by 13% have been reported.

The favorable cost-benefit relationship that the country expends on a per capita basis should be emphasized. Compared with health care in more developed nations, it is commendable that surgical services are available to seven eighths of the population. Perhaps the fact that the

system keeps patients healthy and away from the hospital—in view of the minimal 1.5 beds per 1000 inhabitants and respectable 77.5-year life expectancy—makes this ratio possible. Efforts are being made in quality control and in information technology development to allow the CCSS to better integrate and manage its resources to improve performance. A pilot project at a tertiary care hospital is being conducted to develop an electronic medical record system. Information technology projects have already been implemented in other administrative areas. The aim is to provide widespread analysis of information, leading to informed decisions that should result in better use of resources.

Although the discipline was first established through charitable work by eminent surgeons, and continued thus for almost a century, most accomplishments in surgical services for Costa Ricans have been achieved in the past 3 decades. In this short span, resources have become available to Costa Ricans in an effective cost-benefit manner. Most Costa Ricans receive adequate to good quality surgical services. The symbol of the institution representing a motherland caring for its progeny seems not to be fanciful.

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